



## INHERITANCE 1 - OSPREYS, MALE OR FEMALE?

### Introduction

This extension sheet is aimed as an extension sheet for GCSE Biology/Science or AS or A-level Biology students.

This activity could be done as an individual or small group activity.

Students will need to have covered sex determination in humans and understand the principles of sex chromosomes (male XY and female XX). There is another sheet explaining sex determination in humans.

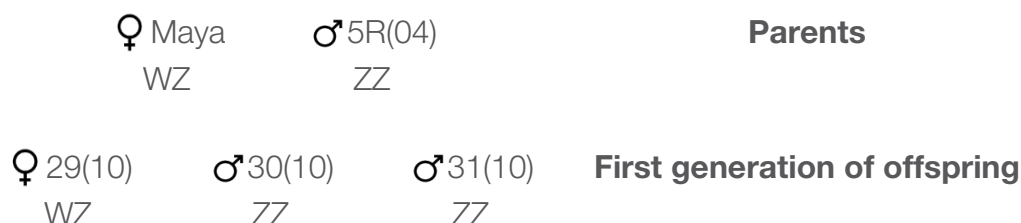
### Answers and discussion points

1. How is the way sex is determined in ospreys:
  - (a) different to humans
    - Human female XX (homogametic sex)
    - Ospreys female WZ (heterogametic sex)
    - Human male XY (heterogametic sex)
    - Osprey male ZZ (homogametic sex)
  - (b) similar humans.
    - Adults in osprey and humans have two sex chromosomes
    - There are two types of sex chromosomes (Humans X and Y, Osprey W and Z)
    - Neither chromosome is “dominant”

### Male or female Osprey?

2. List the five ospreys in the family tree and next to each write down if they are WW or WZ (See above)

The symbols are ♂ for male and ♀ for female





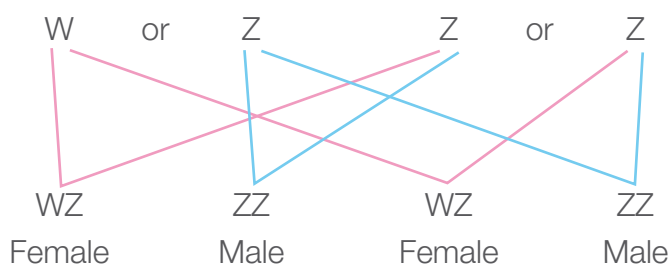
## INHERITANCE 1 - OSPREYS, MALE OR FEMALE? cont.

3. Draw a genetic diagram to show the probability of the offspring for Maya and 5R(04) being male or female.

<b>Parents</b>	♀ Maya	♂ 5R(04)
	WZ	ZZ
<b>Gametes</b>	W or Z	Z or Z

This shows half of the sperm cells will have an X and half will have a Y. All female egg cells have an X chromosome.

Any sperm can fertilise any egg! So the combinations are...



		FEMALE	
		W	Z
MALE	Z	WZ	ZZ
	Z	WZ	ZZ

4. If Maya and 5R(04) had another chick what is the probability of the chick being a male or a female?

When a sperm and egg join it is ALWAYS a 50% chance that it could be ZZ male or WZ, female.

The sex of previous chicks does not have any effect on the probability of the sex of a subsequent chick.

5. In Ospreys the female determines the sex of the chick as her gametes (ova) can be W or Z. In ospreys the male produces gametes (sperms) which are always Z.